Lucent Technologies
Bell Labs Innovations

5ESS®-2000 Switch

The reliability of digital switching — now available for wireless applications.

Boosting revenues. Keeping costs down. Providing your wireless customers with the service levels they demand.

Whatever part of the world your network serves, the Lucent Technologies' AUTOPLEX System 1000 Mobile Switching Center (MSC) offers you the capacity, performance, and functionality to achieve these goals. Reliably and cost-effectively.

This modular, industry-leading wireless MSC consists of five key components working in harmony to provide quality cellular services at an affordable cost:

5ESS-2000 Switch.
A high-capacity, non-blocking digital switch that provides a high-availability switching fabric.

Executive Cellular Processor (ECP) Complex.
This complex contains the system intelligence handling, mobility management, system configuration, and feature control.

Operations and Management Platform (OMP).
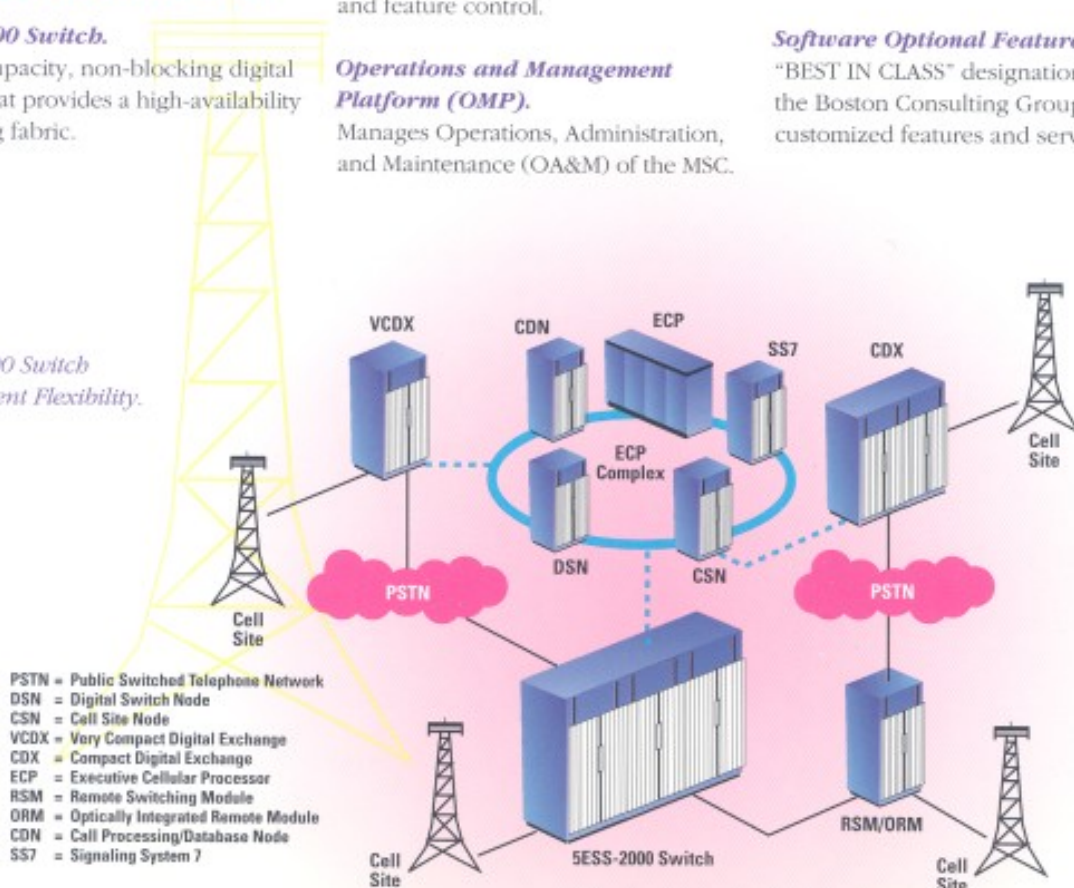Manages Operations, Administration, and Maintenance (OA&M) of the MSC.

Intelligent Network Services.
Enables rapid deployment of enhanced services, making it easier than ever to send and receive wireless communications.

Software Optional Features.
"BEST IN CLASS" designation from the Boston Consulting Group for customized features and services.

5ESS-2000 Switch Deployment Flexibility.

PSTN = Public Switched Telephone Network
DSN = Digital Switch Node
CSN = Cell Site Node
VCDX = Very Compact Digital Exchange
CDX = Compact Digital Exchange
ECP = Executive Cellular Processor
RSM = Remote Switching Module
ORM = Optically Integrated Remote Module
CDN = Call Processing/Database Node
SS7 = Signaling System 7

Emergency personnel rely on the availability of quality wireless service.

The next generation of digital switches for wireless communications — here today.

Whether you're upgrading from a Traditional Module or Reduced Footprint Switch, overlaying an existing network with a second switch, or installing a digital switch in a new MSC, the 5ESS-2000 Switch — Lucent Technologies' premier switching platform — is clearly the smart choice.

One of the most widely deployed high-capacity digital switches in the world for local, toll, gate-way, and advanced services, the 5ESS-2000 Switch has been used successfully in landline networks for over a decade, with a continuous stream of new enhancements and capabilities. With an installed base of more than 2,300 switches, the 5ESS-2000 Switch currently services over 72 million lines in 49 countries.

The 5ESS-2000 Switch at a glance...

To provide the switch fabric and voice connectivity to the Public Switched Telephone Network (PSTN), the 5ESS-2000 Switch uses a flexible, scalable architecture made up of three modular components:

The Administrative Module (AM) handles global switch maintenance, administration, and network management.

The Communications Module (CM) interconnects switching modules, switches network data and voice, controls messages, and distributes timing and synchronization.

The Switching Modules (SM) link subscribers to the PSTN and cell sites.

All global switch functions are in the Administrative and Communications Modules. All local switching functions — call processing, line and trunk management — are in the Switching Modules.

The 5ESS-2000 Switch provides a wide variety of network interfaces including ISDN User Part (ISUP), R1 and R2 MF signaling, and T1 and E1 CEPT transmission.

Setting new standards for wireless switching.

The 5ESS-2000 Switch can offer you significant improvements in capacity, reliability, and scalability over other switching systems currently in use.

The increased capacity to handle your growing subscriber base.
The 5ESS-2000 Switch is a high-capacity exchange capable of handling a greater call volume than the Traditional Module. It can accommodate the full capacity of the ECP with ease — currently more than 200K Busy Hour Call Attempts (BHCA) in the U.S. and up to 200K BHCA for international customers.

A single 5ESS-2000 Switch can provision wireless service from as few as 5,000 to well over 100,000 subscribers. Adding Switching Modules increases capacity as needed. In some applications, multiple

5ESS-2000 Switches may be deployed to support the geographic and network topology of a Mobile Switching Center served by a single ECP Complex.

High system reliability dramatically reduces switch down-time.
The 5ESS-2000 Switch is one of the most reliable digital switches available for wireless systems today.

According to the U.S. Federal Communication Commission's (FCC) ARMIS report, the 5ESS-2000 Switch has the least down-time of any switch used in U.S. networks, exceeding Bellcore's reliability standards by 200%. It has won several awards for reliability.

All equipment used for switching and control is duplicated (or a hot spare provided) to ensure the highest levels of system availability — currently in excess of 99.9999 percent.

Coexists with current applications ...
The 5ESS-2000 Switch supports wireless, landline, gateway, toll, local, advanced ISDN, and other applications coexisting on the same exchange.

The 5ESS-2000 Switch for wireless applications shares the same software platform used by 5ESS-2000 Switches supporting landline networks. By adding an ECP Complex, you can adapt an existing 5ESS-2000 Switch to create a wireless solution — without replacing or upgrading your hardware (excluding required capacity additions).

5ESS-2000 offers you the capacity, performance, and functionality to achieve your goals. Reliably and cost-effectively.

Coexists with your current Digital Cellular Switch.

The 5ESS-2000 Switch is fully compatible with the Traditional Module. So a network with a conventional Digital Cellular Switch can add a 5ESS-2000 Switch and have the two systems co-exist and work together seamlessly within the network. In addition, service providers can easily migrate from their Traditional Module to the fully compatible 5ESS-2000 Switch.

Scalability for future growth protects your network investment.

A distributed architecture allows you to invest today in a 5ESS-2000 Switch that meets current capacity requirements now, then expands modularly as you add subscribers and users.

How does it work? The distributed architecture separates the switching fabric from call processing, which is consistent with the architecture of intelligent networks. Expand capacity by adding either additional Switching Modules or 5ESS-2000 Switches, depending on the quantity and location of new subscribers to be serviced.

5ESS-2000 Switch.

The distributed architecture and modular design of the 5ESS-2000 Switch provide maximum flexibility for provisioning applications and deploying new configurations. So you can prepare for the challenges ahead ... with the assurance of knowing your major network investments are well protected.

Compact Digital Exchange (CDX).

The CDX consists of a standard Administrative Module with a Communications Module Compact (CM2-C). The CM2-C can serve either one SM, one SM-2000, and several Remote Switching Modules (RSMs), or two SMs and several RSMs.

Very Compact Digital Exchange (VCDX).

For even smaller and more rural applications, a scaled-down ECP Complex can be paired with a Very Compact Digital Exchange. In the VCDX, the Administrative and Communications Modules are replaced with a UNIX[1] System V-based workstation which provides administrative and maintenance capabilities. A single Switching Module performs the call processing.

Remote systems.

Stand-alone Remote Switching Modules are used in the most rural and smallest applications that do not require a VCDX.

U.S. customers can also select our optically integrated Remote Module. This module does not require a host Switching Module and is connected directly to a Communications Module.

The 5ESS-2000 Switch's capabilities for Remote Switching Modules and Optical Remote Modules make it possible to economically serve multiple small markets with a single AUTOPLEX System 1000 Mobile Switching Center.

Here are additional advantages you'll enjoy as a 5ESS-2000 Switch user:

Space and facilities savings.

Because a single 5ESS-2000 Switch can handle the full calling capacity of an ECP Complex, you eliminate the need for multiple Traditional Modules, the floor space, switches and the inter-DCS facilities that connect them. Migrating to configurations based solely on the SM-2000 Switching Module will result in further space savings.

Enhanced OA&M.

The Lucent Technologies Mobile Switching Center has a dedicated OA&M system, so that OA&M problems can be taken care of at any time without interruptions to call handling. Use of an enhanced Lucent Technologies 3B21D computer has doubled OA&M processing speed. Lucent Technologies' fully integrated OA&M capabilities reduce the required personnel needed to operate and maintain your Mobile Switching Center, resulting in lower lifecycle costs.
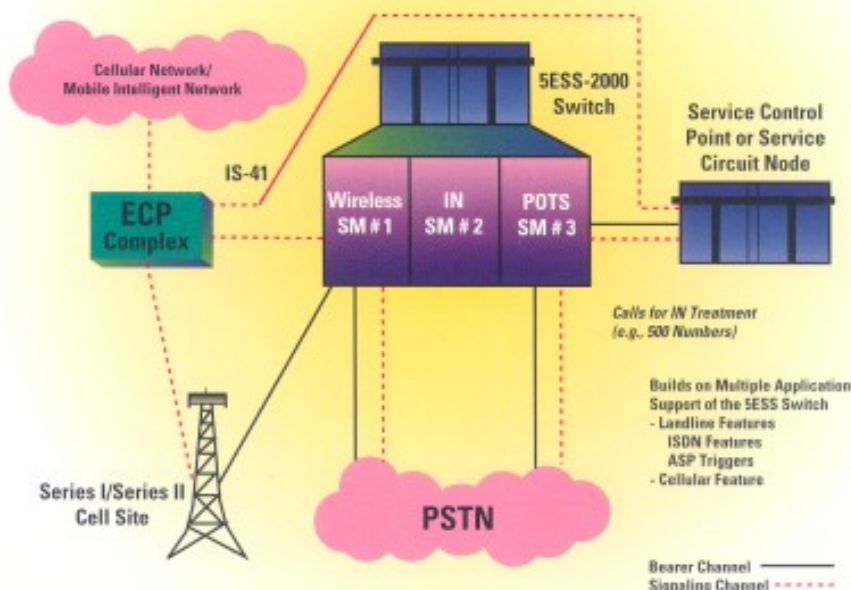
Signaling System 7 (SS7).

The 5ESS-2000 Switch offers Signaling System 7 trunk switching signaling directly to support ISUP and advanced calling features.

Shortened learning curve.

The 5ESS-2000 Switch Master Control Console has a look and feel comparable to the ECP interface, so AUTOPLEX System 1000 users become proficient in the 5ESS-2000 Switch with minimal training. Clear and comprehensive documentation further shortens the learning curve.

Intelligent Network Integration.

Cellular Network/ Mobile Intelligent Network

5ESS-2000 Switch

Service Control Point or Service Circuit Node

IS-41

ECP Complex

Wireless SM #1 **IN SM #2** **POTS SM #3**

Calls for IN Treatment (e.g., 500 Numbers)

Builds on Multiple Application Support of the 5ESS Switch
- Landline Features
   ISDN Features
   ASP Triggers
- Cellular Feature

Series I/Series II Cell Site

PSTN

Bearer Channel ——————
Signaling Channel · · · · · ·

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Automatic diagnostics and simplified maintenance.

The 5ESS-2000 Switch automates nonessential, unattended maintenance activities such as diagnostics and other routine functions, which are performed independently from the ECP. Periodic software uploads keep your switching fabric current with the latest software enhancements and improvements. Robust trunk testing and maintenance capabilities and a supplementary trunk and line workstation further simplify diagnostics and maintenance.

Common components.

The 5ESS-2000 Switch and ECP use the same Lucent Technologies 3B21D computer. Use of common components reduces the cost of spare parts inventory.

Remote configurations.

As an option, the 5ESS-2000 Switch can be located remotely from the ECP Complex. In addition, Remote Switching Modules and multi-module Remote Switching Modules offer an economical means of provisioning digital services to communities and businesses too small to justify a full-scale Digital Cellular Switch.

Supports all major wireless standards in the U.S. and abroad.

We offer international customers an international version of the 5ESS-2000 Switch. It's similar to the U.S. version but with some important added features.

The international version of the 5ESS-2000 Switch supports both the Advanced Mobile Phone System (AMPS) as well as the Global System for Mobile Communications (GSM) and Japan Digital Cellular (JDC), giving you the flexibility to handle a full range of applications.

In-country signaling for the U.S. and over 49 other countries is also supported. This support includes variations of ISUP, ITU-T (formerly CCITT), plus national variances of ISUP and R2 MCF.

In addition, the international version provides both 24 and 30-channel T1 and E1 transmission, eliminating the need for 24/30 adjunct conversion units at the switch end.

Evolving to meet future wireless network requirements.

With the 5ESS-2000 Switch, you have the benefit of true investment protection, as the platform is continually improved to add new features and take advantage of evolving standards and advanced services.

Switch capacity expanded for compatibility with broadband services.

The SM-2000 features a Time Slot Interchange unit with increased capacity to support Asynchronous Transfer Mode (ATM), Synchronous Optical Network (SONET), and Code Division Multiple Access (CDMA). The SM and SM-2000 can be used together on the same 5ESS-2000 Switch, allowing for a smooth migration with investment protection.

Wireless and landline coexistence reduces equipment costs.

The 5ESS-2000 Switch fully supports coexistence of wireless and landline applications on the same switch. This provides economy-of-scale capital savings for customers who are not prevented from coexisting these applications.

By eliminating the need for separate wireless and landline switches, the LCO feature reduces capital costs. Furthermore, the consolidation of the two switches saves floor space while lowering power requirements and operating costs.

CDMA capability enhances voice quality.

The 5ESS-2000 Switch's packet-switching architecture can provide seamless support for CDMA. Use of CDMA in the AUTOPLEX System 1000 will achieve significant improvements in voice quality.

Switching Modules in the 5ESS-2000 Switch will be augmented with CDMA voice processors and other equipment necessary to support large soft-handoff universes. Switch architecture can also support enhanced Cellular Digital Packet Data (CDPD) for data communication.

Intelligent Network services bring new capabilities to your subscribers.

The 5ESS-2000 Switch is the Lucent Technologies platform that will take you, the wireless service provider, into the world of Intelligent Network services.

The platform supports Lucent Technologies' A-I-NET family of intelligent switching products. You will easily integrate these products with your wireless offerings, because the 5ESS-2000 Switches for wireless and landline applications share a common software load line.

By separating service logic from switching functionality, A-I-NET and Intelligent Network software enables service providers to develop and implement new services — such as voice-activated dialing and single number reach — quickly and at low cost, resulting in rapid deployment and revenue generation.
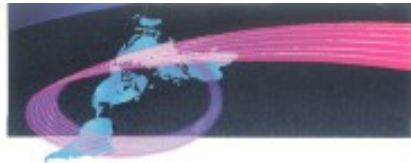
SONET and ATM support give you more bandwidth.

The distributed architecture of the 5ESS-2000 Switch allows graceful migration to ATM and SONET.

A new addition to the 5ESS-2000 Switch, the Digital Network Unit SONET (DNU-S), will provide a direct physical interface to SONET, eliminating the need for multiplexers or other conversion equipment. So you can hook up more physical trunks to the backplane.

Deployment of SONET and ATM offer the combined benefits of greater bandwidth availability for voice and data services with enhanced network flexibility and reliability. You get better performance and higher speed over a larger service area. Equipment may also take less space, depending on network configuration.

A complete family of digital switching solutions to meet your needs.

Different wireless networks have different needs, based on geography, network topology, call volume, number of subscribers, and the type of service required. Lucent Technologies responds with a full line of switching solutions. Ask us which one is right for your application.

PCS support means full mobility for all customers.

The AUTOPLEX System 1000 platform is evolving to support high-mobility Personal Communications Services (PCS) applications. Lucent Technologies' low-power, high-frequency PCS System, based on the AUTOPLEX System 1000, provides full mobility, handling both high-speed vehicle service and pedestrian walk-around service. Applications that PCS can provide your wireless subscribers include single number reach, who's calling, fraud management, cellular voice dialing, location finder, intelligent voice mail ... and many others.

When you want to talk wireless, give us a call.

Lucent Technologies — formerly AT&T's systems and technology business — was the first to develop, manufacture, install, and test cellular service.

With Lucent Technologies as your provider, you can be sure you are getting solutions that are among the best technology has to offer, backed by one of the most comprehensive support packages in the industry.

For more information on how the 5ESS-2000 Switch can enable you to add subscribers, services, and applications while enhancing quality and reducing costs, please contact your Lucent Technologies Account Representative or call:
1-800-344-0223 x5014 (United States)
314-536-1886 (outside United States)

[1]UNIX is a registered trademark of UNIX Systems Laboratories, Inc. (a wholly owned subsidiary of Novell, Inc.)

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